GEORGIA INSTITUTE OF TECHNOLOGY

ENGINEERING EXPERIMENT STATION

no action

PROJECT INITIATION

Date: June 24, 1975

Project Title: Improvements for Gum Naval Stores Industry

Project No.: A-1745

Project Director: Mr. Jerry L. Birchfield

Sponsor: Georgia Forest Research Council

Agreement Period: From June 18, 1975 Until June 17, 1976

Type Agreement: Contract dated 6/9/75

Amount: $50,000

Reports Required: Monthly Progress; Final (Annual) Technical

Sponsor Contact Person:

Mr. Darrell L. Fuller
Deputy Director
Georgia Forest Research Council
P.O. Box 828
Macon, Georgia 31202
(912) 746-3531; 746-1551

Assigned to: Technical Support Department

COPIES TO:

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Other Sue Corbin; Bonnee Wettlaufer

RA—3 (3—75)

GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION

SPONSORED PROJECT TERMINATION

Date: 12/1/76

Project Title: Improvements for Gum Naval Stores Industry

Project No: A-1745

Project Director: Mr. J. L. Birchfield

Sponsor: Georgia Forest Research Council, Macon, Ga. 31202

Effective Termination Date: 6/17/76

Clearance of Accounting Charges: 6/30/76

Grant/Contract Closeout Actions Remaining:

- X Final Invoice and Closing Documents
- _ Final Fiscal Report
- X Final Report of Inventions
- _ Govt. Property Inventory & Related Certificate
- _ Classified Material Certificate
- _ Other _____

Assigned to: Productivity/Technology Applications (School/Laboratory)

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CA-4 (3/76)

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

August 11, 1975

Mr. H. E. Ruark
Georgia Forest Research Council
P. O. Box 828
Macon, Georgia 31202

Subject: Monthly Progress Letter for EES/GIT Project A-1745 for Period 18 June 1975 to 1 August 1975

Dear Mr. Ruark:

This initial monthly progress letter for the project will include the total period mentioned above.

Our efforts during this period have been directed to familarization of our engineers and problem definition within the industry. To accomplish this a visit was made to the Georgia Forestry Commission Station in McRae where Grady Williams demonstrated current gum collecting operational procedures and methods. Additionally, visits were made with Mr. Foy of Lerio Corporation in Valdosta to ascertain their position relative to cup and gutter fabrication, with the USDA group at Olustee and with Mr. Bob Collier of Union Camp to seek their ideas relative to our efforts. From these visits several ideas were generated that we will discuss at our next advisory committee meeting.

Our efforts during the next period will include preliminary design work on several powered tools.

Respectfully submitted,

J L Birchfield

Jerry L. Birchfield
Project Director

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A-1745

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

September 3, 1975

Mr. H. E. Ruark
Georgia Forest Research Council
P. O. Box 828
Macon, Georgia 31202

Subject: Monthly Progress Letter for EES/GIT Project A-1745
for Period 1 August 1975 to 1 September 1975

Dear Mr. Ruark:

During this period activity was at a reduced level because of previously scheduled vacations. However, efforts were expended into the preliminary design modification of the powered rossing tool. Also, manufacturers were contacted to find a lighter power supply for the tool. The concepts generated during this work will be finalized during the next period in preparation for fabrication and testing. These ideas and others will be discussed during our planned September advisory committee meeting.

Sincerely,

J L Birchfield

Jerry L. Birchfield
Project Director

mh

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

October 3, 1975

Mr. H. E. Ruark
Georgia Forest Research Council
P. O. Box 828
Macon, Georgia 31202

Subject: Monthly Progress Letter for EES/GIT Project A-1745 for Period 1 September to 30 September 1975 (3)

Dear Mr. Ruark:

During the period efforts were expended to analyze alternative cup and gutter systems. It was found that a two quart plastic cup is available from Lerio Corporation at an approximate cost to manufacturer of 16 cents. Currently Lerio manufacturers a galvanized iron cup for a manufacturer's cost of about 34 cents each. We have found no way to appreciably reduce this cost of manufacture because the majority of the cost is for materials and not the fabrication process. Also it appears that very little can be done to reduce the 3 cent manufacturing cost of the gutter system.

This information was presented to the GNS Advisory Committee on September 25 and they were in agreement with the above. However it was suggested that several thicknesses of the plastic cup be field tested to see how they stand up and to give the growers a better choice. We agreed to investigate this and to report back to you and the ATFA.

Preliminary analysis was begun on the power rossing tool with efforts concentrated on a lighter power supply for the Olustee concept and a new independent cutter relative to the power supply. Indications are that the weight should be reduced from 18 to about 10 pounds which the Advisory Committee deemed very acceptable. Design and fabrication are continuing on both rossing tool concepts.

Sincerely,

James F. Lowry
Project Director

mh

Approved by: _____
R. L. Yobs, Laboratory Director

A-1745

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

November 11, 1975

Mr. H. E. Ruark
Georgia Forest Research Council
P. O. Box 828
Macon, Georgia 31202

Subject: Monthly Progress Letter for EES/GIT Project A-1745 for Period 1 October 1975 through 31 October 1975.

Dear Mr. Ruark:

During this period and as a result of our Advisory Committee meeting inquiries were made of Lerio Corporation as to the possibility of a reinforced wall cup. They are unwilling to modify their mold as they consider the current 0.065 inch cup to be acceptable. They are planning to market the cup this season with manufacturing to be done in December.

Lerio will construct molds and make modified cups for us at a cost of $5500 per mold and $500 for 1000 cups. However they are concerned that the thicker wall will have problems during the cooling process. This occurs because the outside cools while the inside is still hot and results in stress buildup and resulting cracking. A solution would be to control the rate of cooling using water jackets.

We at EES as you know felt this was important enough to discuss with the President of the American Turpentine Farmers Association. Mr. Jim Gillis, Jr. and I met and discussed the situation. He agreed that we should not produce the modified cups since Lerio appears to have an acceptable one. At least gum farmers that wish can purchase them and perform actual field use tests over a multiyear period while deciding if the cup is acceptable. This essentially completes our effort relative to the cups and gutters.

Relative to the rossing tool, a XL Home-lite saw has been purchased and the design of components for adapting to the rossing process is continuing. Drawings are being prepared and machining has commenced on these components. It is expected this will be ready for testing by the end of the next period.

Respectfully submitted,

R. L. Yobs

James F. Lowry
Project Director

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A-1745

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

December 2, 1975

Mr. H.E. Ruark
Georgia Forest Research Council
P.O. Box 828
Macon, Georgia 31202

Subject: Monthly Progress Letter for EES/GIT Project A-1745
for Period 1 November 1975 through 30 November 1975

Dear Mr. Ruark:

During this period machining of parts for the powered rossing tool was completed. The tool was assembled and tested on local pine trees. During this phase a weakness in the lightweight shield was experienced resulting in failure of the shield. Otherwise the tool works acceptably. Redesign of the shield has been accomplished and this is currently being fabricated. It is anticipated the changes will add very little weight to the finished product.

In the process of operations it became apparent that the rossing tool requires a special sharpening apparatus and a system adaptable to a table grinder has been designed and fabricated.

As you are aware an Advisory Committee meeting will be held on December 18, 1975 at the Forestry Commission facility in McRae, Georgia. At this time the powered rossing tool and sharpening mechanism will be demonstrated.

Information is in the process of being gathered relative to possible designs for a powered chipping tool. This effort will continue through the next period.

Respectfully submitted,

James F. Lowry

James F. Lowry
Project Director

JFL:sm

R. L. Yobs, Director

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

January 6, 1976

Mr. H. E. Ruark
Georgia Forest Research Council
P. O. Box 828
Macon, Georgia 31202

Subject: Monthly Progress Letter for EES/GIT Project A-1745
for Period 1 December 1975 through 31 December 1975 6)

Dear Mr. Ruark:

During this period the design and assembly of the power rossing tool was completed. Changes in blade design negated the need for a special sharpening apparatus and this effort was stopped. The resulting shield was of a flexible rubber material and added no weight to the tool. This was the tool demonstrated at the Advisory Committee meeting.

An advisory committee meeting was held at the Georgia Forestry Commission compound in McRae, Georgia on December 18, 1975. At this meeting the above rossing tool was demonstrated and operated by several of those available. The general response was that the tool was light enough, about 10 pounds, and accomplished the job. However, it was felt that the angle of the blade relative to the tree should be adjusted and this will simply be done by moving the guide bar rearward. As the tool operates at a very high speed the bark becomes a very fine dust, however the dust never rose above the operator's waist and none was directed to his eyes so that this was completely acceptable.

A final report was made as to the cost of manufacture of plastic cups. Mr. Carol Girtman of the American Turpentine Farmers Association and Mr. Ray Shirley of the Georgia Forestry Commission suggested that a few thousand cups be bought by individuals and put into use this coming season. Mr. Girtman will talk with several farmers and contact Lerio Corporation for the cups. This concludes our efforts as to the cups.

Mr. Shirley agreed to let Grady Williams bring their prototype gum pickup vehicle to EES for us to engineer and improve as desired. We both agreed to work very closely to come up with an optimum cost effective design and the commission will build several for field testing.

During the next few months, the rossing tool will be used by several farmers to get a field test evaluation. Efforts on this test work, chipping tool and vehicle will continue through the next period.

Respectfully submitted,

James F. Lowry
Project Director

R. L. Yobs, Laboratory Director

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

February 3, 1976

Mr. H. E. Ruark
Georgia Forest Research Council
P. O. Box 828
Macon, Georgia 31202

Subject: Monthly Progress Letter for EES/GIT Project A-1745
for Period 1 January 1976 through 31 January 1976 (7

Dear Mr. Ruark:

During this period modification and testing of the powered rossing tool continued. The XL model guide bar was moved rearward and made adjustable to give a better cutting angle. This machine was then exhaustively tested by engineering and farm personnel during a three day period on the Carol Girtman farm. In fact Mr. Girtman's entire complement of trees were successfully rossed. Comments from the field hands were highly complimentary of the tool however it was felt to be slightly underpowered. To alleviate this a tool is being constructed with all desired modifications on a Homelite EZ power base which will give 50% more power with less than one pound additional weight. During the next period this tool will be tested.

Development and design of the chipping tool is continuing and it is anticipated a demonstratable tool will be available the next period.

Respectfully Submitted,

James F. Lowry

R. L. Yobs
Laboratory Director

A-1745

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

March 3, 1976

Mr. H. E. Ruark
Georgia Forest Research Council
P. O. Box 828
Macon, Georgia 31201

Subject: Monthly Progress Letter for EES/GIT Project A-1745 for Period 1 February 1976 through 29 February 1976 (8)

Dear Mr. Ruark:

During this period the final modification to the XL model rossing tool were completed and field testing was accomplished on the Jim Gillis, Jr. farm. Results were highly positive; however, the thicker bark required the higher powered EZ model. Modifications to this model are essentially complete and final testing will be conducted early next period.

Fabrication of a powered chipping tool is underway. However, the outlook is not optimistic that a system can be developed as lightweight as the current manual chipper. This appears to be a much more difficult system than the rossing tool. However, we are proceeding in a step-by-step manner with the idea of developing the best system possible.

Several discussions were held with the Forestry Commission personnel relative to assisting with an updated and improved version of the powered vehicle.

Respectfully submitted,

J. F. Lowry

R. L. Yobs
Laboratory Director

ljb

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

April 9, 1976

Mr. H. E. Ruark
Georgia Forest Research Council
P. O. Box 828
Macon, Georgia 31201

Subject: Monthly Progress Letter for EES/GIT Project A-1745 for Period 1 March 1976 through 31 March 1976

Dear Mr. Ruark:

Final testing of the XL and EZ models of the rossing tool has been completed with good acceptance by the Forestry Commission and industry personnel. This completes work on this task for this study.

Fabrication of the chipping tool was completed, testing with Grady Williams was completed and changes were made to ease the handling of the device. Because of time and fiscal limits this will be the final iteration of the chipping tool.

No work was accomplished on the Forestry Commission powered vehicle; however, full effort is scheduled next period.

Preparation of the final report was begun.

Respectfully submitted,

J. F. Lowry

R. L. Yobs
Laboratory Director

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ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

May 11, 1976

Sent 6/11/76

Mr. H. E. Ruark
Georgia Forest Research Council
P. O. Box 828
Macon, Georgia 31201

Subject: Monthly Progress Letter for EES/GIT Project A-1745 for Period 1 April 1976 through 30 April 1976

Dear Mr. Ruark:

Grady Williams of the Forestry Commission brought their second generation power vehicle to the Engineering Experiment Station for assistance in the component design. It is our opinion that this concept is extremely practical from a cost and performance view and that a great deal of work would be required to improve it. At that, the production cost might be prohibitive for full utilization by the industry. Our contributions have consisted of recommending improved or less expensive components, and several items have been improved in this manner.

The final chipping tool design was tested in McRae and is acceptable from an operational standpoint. However, weight of the device may mitigate its utilization throughout the industry.

The final report is in preparation and it is anticipated that it will be completed within schedule. A final advisory committee review meeting is scheduled for the next period.

Respectfully submitted,

James F. Lowry

R. L. Yobs
Laboratory Director

ljb

ENGINEERING EXPERIMENT STATION
GEORGIA INSTITUTE OF TECHNOLOGY • ATLANTA, GEORGIA 30332

June 8, 1976

Mr. H. E. Ruark
Georgia Forest Research Council
P. O. Box 828
Macon, Georgia 31201

Subject: Monthly Progress Letter for EES/GIT Project A-1745 for Period 1 May 1976 through 31 May 1976

Dear Mr. Ruark:

The final advisory committee meeting for the Gum Naval Stores project was held in Macon on May 7, 1976. At that time the complete results of work on the rossing tool, chipping tool and vehicle were presented. The committee agreed that the powered rossing tool has been engineered to an acceptable level and that in-field use tests over a few seasons are needed. The prototypes are to be made available to the Forestry Commission for this purpose.

The committee indicated the chipping tool is not to this stage of development and that more engineering work will be required. The primary problem is the overall weight of 8+ pounds and the vibration created by the chipping operation is worse than the physical labor with the existing manual chipping tool.

Recommendation made for the vehicle developed by the Forestry Commission were well received and will be evaluated with the overall design. Of special interest was the oil bath, clutch assembly which will solve a major problem with the vehicle.

The final report has been completed and is being reviewed for publication.

Many thanks to you, your organization and to those in the Forestry Commission for your complete cooperation. You have made this a most pleasant research effort and the positive results possible.

Respectfully submitted,

James F. Lowry

R. L. Yobs
Laboratory Director

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